HHS Public Access

Author manuscript

J Assoc Nurses AIDS Care. Author manuscript; available in PMC 2016 May 06.

Published in final edited form as:

J Assoc Nurses AIDS Care. 2015 ; 26(5): 680–688. doi:10.1016/j.jana.2015.05.004.

Mano a Mano for Health Professions Students in Chile: A Pilot HIV Prevention Program

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Keywords

AIDS; attitude; education; HIV; knowledge; nursing

HIV is cause for major concern all over the globe. By the end of 2009, there were 33.3 million reported cases of people living with HIV (PLWH) worldwide, with 2.6 million new infections and 1.8 million HIV-related deaths (Joint United Nations Program on HIV/AIDS [UNAIDS], 2010). Specifically in Latin America, the incidence of HIV has increased from 1.1 million adults and children living with HIV in 2001 to 1.4 million adults and children living with HIV in 2009 (UNAIDS, 2010). Additionally, the rate of new infections has

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Disclosures

The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

grown, as there were 150,000 reported cases of new infections in 2001 and this number increased to 170,000 reported cases of new infections in 2008. While in other regions of the world the rate of new infections has declined, Latin America has yet to experience this reduction in new infection rates (UNAIDS, 2009).

Although, in comparison to other Latin American countries, Chile has a lower incidence of PLWH, HIV is still a serious public health concern. By 2010, 23,997 cases of HIV and AIDS were recorded; however, it has been estimated that only 63.2% of PLWH are included in this number (Ministerio de Salud, 2011). The lack of accurate documentation of HIV cases makes it difficult to understand the scope of the epidemic. However, according to UNAIDS (2009), in 2008 the estimated prevalence of HIV for adults ages 15–49 years was 3 per 1,000, and 31,000 Chileans were estimated to be living with HIV. This is a significant increase compared to 2001, when 25,000 Chileans were estimated to be living with HIV (UNAIDS, 2009). This increase in cases of PLWH demonstrates the lack of effective prevention strategies and awareness of the prevalence of HIV in Chile, and the need for professionals educated about HIV in Chile.

The lack of awareness and concern about HIV prevalence in Chile was confirmed in a study by Ferrer and colleagues (2007), in which 45 university students filled out questionnaires related to HIV knowledge, attitude, and personal concern. Results revealed that these students had quite high levels of HIV-related knowledge, as 77% of participants earned scores of 81% or higher on the HIV knowledge portion of the questionnaire. While this result was promising, the questions that participants consistently answered incorrectly were troubling. For example, 51% of the participants answered the question asking whether all bodily fluids contain HIV incorrectly. Moreover, 31% of participants answered the question inquiring whether HIV could be transmitted in a public bathroom incorrectly. The results were concerning, as they demonstrated that even in an academic population there was unsubstantiated fear and lack of knowledge due to erroneous beliefs about HIV transmission. Additionally, and even more distressing, was that 55.6% of the students reported that they were not personally concerned about HIV, which showed a lack of apprehension and awareness of the prevalence of HIV in the student population in Chile. Similar results were also found in a study about knowledge of HIV by primary health workers in Chile (Cabieses, Ferrer, Villarroel, Tunstall, & Norr, 2010).

Nurses play an essential, yet often underappreciated, role in HIV prevention and, as nurses make up a large portion of health care service providers, the potential impact they may have on both HIV prevention and treatment is huge (Cook, McCabe, Emiliozzi, & Pointer, 2009; Pan American Health Organization, 2004; World Health Organization, 2006). However, because of false beliefs, stigma, and other negative attitudes, the potential nursing contribution to the HIV epidemic is not always fulfilled (Cianelli et al., 2011).

Seventy percent of the Chilean population identifies as Catholic, which greatly affects the opinions of the general population, as Catholic beliefs are associated with discrimination against homosexuals (Cianelli, 2003; Comision Nacional del XVII Censo de Población y VI de Vivienda, 2003; Finlay & Walther 2003). This situation influences HIV-related beliefs, as people frequently associate HIV with the commonly stigmatized groups: homosexuals, sex

workers, and drug addicts (Capitanio & Herek, 1999; Herek & Capitanio, 1999; Krasnik, Fouchard, Bayer, & Keiding, 1990; Lau, Choi, Tsui, & Su, 2007). Correspondingly, in a qualitative study by Cianelli and colleagues (2011), many negative attitudes about PLWH in health workers were found to be related to discrimination against and myths related to homosexuals, as homosexuality is not yet widely accepted in Chile. For example, many of the health workers in the study believed homosexuals were responsible for the course of HIV, and that homosexuals naturally took more risks, leading to the acquisition of HIV. Another theme revealed in the study related to negative attitudes was a fear of HIV driven by the threat of stigma, lack of HIV-related knowledge, and the personal risk of contracting the virus. Risk of exposure to HIV was mentioned in conjunction with lack of knowledge and practice of standard precautions. The deficiency in standard precautions knowledge caused many health workers to compensate with faulty prevention measures, for example, wearing two pairs of gloves or breaching confidentiality to warn colleagues that a patient with HIV had arrived for treatment (Ferrer et al., 2009). The fact that many health workers embraced fictitious beliefs as truth and allowed them to affect the quality of treatment is cause for major concern and a clear call for additional HIV-related training (Conejeros, Emig, Ferrer, Cabieses, & Cianelli, 2010).

In the past, interventions for medical, nursing, and health technician students have been successful in changing negative behaviors and attitudes toward PLWH (Pickles, King & Belan, 2009; Yiu, Mak, Ho, & Chui, 2010). In a study by Valois, Turgeon, Godin, Blondeau, and Cote (2001), third-year nursing students were placed in either the *persuasive message* intervention group or the control (no intervention) group. Measures were taken at baseline and postintervention. Positive changes in knowledge, attitude, perceived behavior control, and intention were statistically significant in the intervention group. The results indicated that an HIV-specific intervention for nursing students was effective in improving HIV-related knowledge and general attitudes toward the treatment of PLWH.

An HIV intervention for rural health workers in Malawi was found to be effective in improving both personal and job-related HIV knowledge, attitudes, and behaviors for rural and urban health workers, including more use of standard precautions, more HIV prevention teaching, and respectful interactions with clients (Chimango et al., 2009; Kaponda et al., 2009; Norr et al., 2006). Participants' general knowledge of universal precautions (cleaning, glove wearing, hand washing, and sharps) improved from 77.43% at baseline to 79.23% at postintervention, a small yet statistically significant development (Chimango et. al., 2009). General HIV knowledge increased from 80.7% at baseline to 92.1% at postintervention, and self-efficacy for community prevention improved from 2.78 at baseline to 2.90 at postintervention using a scale of 1 (*not confident*) to 3 (*very confident*). Self-efficacy for safer sex increased significantly from 2.42 at baseline to 2.82 at postintervention on a scale from 1 (*not confident*) to 3 (*very confident*). Finally, attitudes of stigma and blame were reduced from 1.46 at baseline to 1.09 at postintervention on a scale of 1 (*not to be blamed*), 2 (*I don't know*), and 3 (*should be blamed*; Kaponda and colleagues, 2009).

The intervention successfully used in Malawi (Chimango et al., 2009) has been tailored to fit the Chilean cultural context, applied to various populations such as health workers and vulnerable men and women, and is now called *Mano a Mano [Hand to Hand]* (Norr, 2004–

2010; Norr et al., 2006). The *Mano a Mano* intervention is based on adult learning theories supported by Bandura (1994), Freire (1970), and Knowles (2003), who posited that learning occurs through social interaction and modeling. Because of this, the *Mano a Mano* intervention is conducted in groups. Each *Mano a Mano* participant is considered to be a person filled with experiences from her/his own cultural context and is therefore regarded as a source of knowledge about his/her own reality, as well as a resource for personal learning and the learning of others. In each group a facilitator provides an accepting environment of recognition in which participants can feel open to contribute, guides interpersonal interactions, organizes education activities, transmits information, orients learning toward group needs, identifies individual characteristics to foster learning, and serves as an agent of change. *Mano a Mano* provides the most favorable conditions for learning self-efficacy, which is key in the formation of leaders (Bandura, 1994; Villanueva, 2008).

The *Mano a Mano* intervention has been contextually tailored for Chilean health workers through formative evaluation (Norr, 2004–2010). In an article based on these results (Ferrer et al., 2009), participants in the intervention demonstrated an increase of more than 10% in HIV knowledge based on the HIV knowledge index measure taken at baseline (71.9%) and postintervention (83.3%). General self-efficacy also significantly improved from 2.53 at baseline to 2.74 postintervention, as well as self-efficacy for prevention at work, which improved from 2.49 at baseline to 2.72 postintervention, based on scales of 1 to 3. Significant changes in HIV prevention behavior at work were reported, from 27.2% at baseline to 53.6% at postintervention. Additionally, a significant increase in partner communication was reported, from 1.34 at baseline to 1.70 at postintervention. Finally, knowledge of all aspects of Standard Precautions significantly increased from baseline to postintervention; however, the biggest increases in knowledge were in needle disposal, from 46.4% at baseline to 67.1% post-intervention, and knowledge of safe boxes for sharps increased from 79.8% to 92.7% at postintervention (Ferrer et al., 2009).

After considering the clear need for health professionals trained in HIV and reflecting on the successful outcomes of the *Mano a Mano* intervention applied to health workers, as well as other interventions that have been applied to nurses specifically, it was clear that the *Mano a Mano* intervention should be adapted and used with nursing students. The purpose of this pilot study was to determine whether the *Mano a Mano* intervention was an adequate HIV prevention strategy for medical and nursing students in training, with the intent to consider its incorporation as part of regular training for students during their last years of training.

Materials and Methods

Study Design

A pre-experimental design was used for this study. The study was funded by the Pontificia Universidad Católica de Chile (DIPUC 2005/CE027; PI: Ferrer, L.) and was approved by the Ethics Committee of the School of Nursing, Pontificia Universidad Católica de Chile.

Setting and Sample

The research was conducted in the Metropolitan Region of Santiago within accredited nursing and medical school programs at an accredited university, which was one of the leading institutions in the country and in Latin America. Twenty-six students participated in the study: 14 nursing students and 12 medical students, all in their last years of training. The average age was 23.5 years (SD = 1.55); 65.4% were women and 34.6% were men. All students were invited to participate, and fewer than 15% demonstrated interest in participating in the intervention. This is important to acknowledge.

Recruitment was done by e-mail and directly during classes by the principal investigator, who did not have a direct relationship with the potential subjects. Also, snowball sampling occurred.

Intervention and Evaluation

Participants took part in an evaluation prior to and after the intervention. The evaluation consisted of an Objective Structured Clinical Examination (OSCE), which used actors to simulate three situations that required assistance related to HIV care: (a) the student must give a reactive HIV-test result to a simulated patient, (b) the student must provide HIV prevention tools to a pregnant woman, and (c) the student must ask the simulated patient to sign a consent form to take an HIV screening test before donating blood. Additionally, participants completed a questionnaire that contained questions on general knowledge about HIV and the content of the Chilean Law for HIV, which states that patients must give informed consent before getting an HIV test and that the results of said test must be kept confidential. The questionnaire used for data collection before and after the intervention in our study was culturally adapted for the Chilean cultural context based on a qualitative formative evaluation (Ferrer et al., 2009). The modified direct translation method was used to translate the questionnaire into Spanish (Behling, Low, Severino, Boldt, & Hardman, 2003), using a team of bilingual researchers. The research team, in collaboration with nursing students, then piloted the questionnaire.

The intervention was delivered in four sessions for a total of 16 hours of training. The primary objectives of the first session were to recognize how HIV affects the human body; identify the most frequently used examinations for HIV screening and confirmation of HIV; review the history of HIV; and discuss the importance of prevention, examinations and treatment, epidemiology, pathophysiology, and transmission. In Session 2 the main objectives were to recognize and discuss the inherent ethical aspects of working in health care, analyze the role of health workers in providing care based on human dignity, identify attitudes and behaviors that promote and/or suppress the prevention of HIV (including appropriate use of standard precautions), recognize the aspects of HIV law and how it affects health workers in everyday practice, and discuss how to boost the health system based on respect of human dignity. In Session 2, sexually transmitted infections and the human reproductive system were discussed in detail. Session 3 included information and discussion about strengthening communication abilities, recognizing how communication influences adaptation to the processes of diseases and their treatments, and identifying effective communication methods that encourage HIV prevention. Finally, in Session 4, the primary

objectives were to practice listening and communication techniques learned in Session 3, and to identify the elements that should be present in counseling (both pre-HIV test and post-HIV test), as well as discuss personal experiences with HIV in a health care setting. In all four sessions participants took part in various interactive activities, which facilitated the learning and application of newly learned ideas and information. The exact times and days of interventions were determined by participant availability.

Our study was conducted during 2005. The Pontificia Universidad Católica School of Nursing Institutional Review Board approved the study protocol prior to its implementation. All participants signed the informed consent.

Variables and Operational Measures

HIV-related knowledge—The general aspects of knowledge consisted of 30 questions derived from a scale developed by Heckman and colleagues (1995), and has been used in Latino populations with acceptable internal consistency (Cronbach's alpha = 0.75), and the Ministerio de Salud (2000), which had been previously used with the Chilean population. Participants had the option to respond *Yes*, *No*, or *I do not know*. A total score was calculated; a correct response was worth 1 point and incorrect item or lack of knowledge contributed 0 points. The final score achieved was distributed between 0 and 30 points, where higher scores represented better knowledge. Legal aspects related to knowledge were measured using questions developed by a panel of experts in the field. These items were used to determine the level of knowledge of the Chilean AIDS law, number 19,779 in the penal code. Participants responded to 18 questions measuring this aspect of knowledge. A total score calculated for the variable knowledge about HIV could fall between 0 and 48.

Risk perception—Risk perception was assessed based on students' perceptions of personal risk and personal risk compared to other people in the community. This five-item scale has been used with health workers in Chile (Norr, 2004–2010).

Self-efficacy—Self-efficacy was measured as six single-item self-assessments of students' confidence in their abilities to carry out behaviors relevant to HIV prevention. These items have been used by Norr and colleagues (2006) in Malawi.

Stigma and discrimination—Stigma and discrimination were measured using eight items developed by UNAIDS (2004) about discrimination toward PLWH.

Global performance—At the end of the three Objective Structured Clinical Examination (OSCE) stations, participants were evaluated based on patterns of overall performance assessment of knowledge and communication skills demonstrated during the interview. Those who responded inappropriately and ineffectively, showing lack of knowledge and/or communication and relationship skills, qualified as *incompetent*, and those who responded skillfully to the task, consistently integrating all components or knowledge and communication skills, were deemed *competent* (Hodges & McIlroy, 2003). The assessment of global performance was conducted by a third hidden observer who evaluated the overall interaction between the student and actor, as detailed by the structured guideline previously defined by the research team.

Statistical Analysis

The analysis used descriptive statistics for the characterization of the sample in relation to demographic variables (gender, age, and career–nursing or medicine), and for the level of knowledge before and after the intervention. To compare results before and after the intervention, a Wilcoxon test, the equivalent nonparametric of T-test for paired samples, was conducted with a confidence level of 95%. Additionally, Chi-squared analysis was used to measure dichotomous variables. The computer software SPSS 16.0 was used for all analyses (IBM, Armonk, NY).

Results

Thirty-eight students participated in the preintervention evaluation. Twenty-seven students participated in the final postintervention evaluation, giving 14% attrition. Of the 27 students in the final evaluation, 17 were women and 10 men, 14 were nursing students, and 13 were medical students, all in the final years of study.

After the intervention, participants significantly increased their levels of HIV-related knowledge, despite the fact that, on average, the level of HIV-related knowledge was relatively high. Additionally, participants decreased their levels of stigma and discrimination toward PLWH. However, the difference between the scores on the self-efficacy scale, prior to and after the intervention, showed no significant differences (Table 1).

Furthermore, after the intervention, participants significantly increased their perceptions of risk of contracting HIV ($p = .05$). Before the intervention, 65.4% of participants thought that the chances of people in their close groups acquiring HIV were *low* or *very low*; after the intervention this percentage decreased to 57.7%. Additionally, when asked how many people in a group of 100 could be living with HIV, the average number estimated before the intervention was 1.58 people, after the intervention the number increased to 4.15 people.

In terms of global performance postintervention, students were significantly more competent at stations evaluating communication skills and techniques for dealing with simulated patients for HIV-related topics. However, when separately analyzing the three stations where students participated, it was found that delivery of a reactive HIV-test result to a simulated patient showed no significant improvement in the participants' global performance (station 2 posttest counseling, see Table 2). This could be explained by the greater perceived difficulty associated with this station, as it required that participants use skills and knowledge recently obtained through the training. The other stations were not perceived to be as difficult and seemed to be simpler to complete successfully.

The pilot of our intervention to describe the impact of *MM-Health Students* on HIV-related knowledge, risk perception, self-efficacy, stigma toward PLWH, and global performance by Chilean health professions students in their last years of study showed positive results. In terms of knowledge, there was a 3-point improvement in overall knowledge after the training intervention ($p < .0001$). Similar results appeared for risk perception, stigma, and discrimination toward PLWH, as both dimensions improved after training ($p < .05$ and $p < .0001$, respectively). Self-efficacy, however, did not improve after the intervention. In

addition, when observing the global performance of the three related OSCE stations, two significantly improved after HIV training (stations 1 and 3 on pretest counseling and asking for consent to complete an HIV test). However, in station 2, where participants were to demonstrate newly acquired posttest counseling when giving a reactive HIV-test result to a simulated patient, skills did not improve as expected after the training.

Discussion

As presented in the first section of this paper, relevant studies in the literature assess knowledge, attitudes, and perceptions toward HIV in both health workers and university students. Findings from our pilot study were consistent with previously reported observational studies, in which the knowledge of HIV in students and health professionals from Chile and other countries has been weak in several domains (Chimango et al., 2009; Ferrer et al., 2007; Kaponda et al., 2009; Norr et al., 2006). In addition, interventions for health professions university students have also shown significant improvement in knowledge and positive attitudes after education (Pickles et al., 2009; Valois et al., 2001; Yiu et al., 2010). Our study, however, was the first to explore the possible benefits of conducting an HIV training program for both medical and nursing students and included innovative assessment methods (i.e., the use of the OSCE examination procedure with simulated real-life situations).

Regarding risk perception, stigma, and discrimination, our positive results were also consistent with similar broader interventions conducted in Chile among health workers, women, and men (Cabieses et al., 2010; Cianelli et al., 2011; Ferrer et al., 2009; Norr et al., 2006). Interventions that have been tailored and culturally adapted have been proven to increase awareness and reduce levels of stigma and discrimination in diverse settings, even among participants who were initially resistant to accepting information due to the existence of ingrained false beliefs and myths associated with HIV (Cianelli et al., 2011; Comision Nacional del XVII Censo de Población y VI de Vivienda, 2003; Finlay & Walther, 2003).

The two dimensions that did not significantly change postintervention, stigma toward PLWH and performance at posttest counseling (delivering a reactive HIV-test result), were closely related. Self-efficacy related to the students' perceived confidence in their abilities to accomplish behaviors was relevant to prevention and HIV care. However, the second station in the OSCE global performance evaluation was the most challenging in terms of skills demonstration. Giving a reactive HIV-test result, even in a simulated scenario with actors, is difficult. Emotional crisis management, dealing with nerves and anxiety related to giving bad news, and adequately referring to other HIV support systems during a brief appointment is very demanding. Nonetheless, the management of this situation can be improved through training and exposure to the situation, and could be a key aspect to modify, in future, broader education interventions (Pickles et al., 2009; Yiu et al., 2010).

Ours is the first study to explore potential benefits of an education intervention to improve knowledge, attitudes, and behaviors related to HIV in nursing and medical students in Chile. A broader and more expanded research should be considered to further test the intervention. In Chile, nursing, medical, and other university students could benefit from improving

knowledge and reducing stigma and discrimination toward PLWH. An intervention of this kind, as a probable natural consequence, could modify erroneous beliefs and myths associated with HIV over time, and has the potential to support health professionals so that they are prepared to fulfill their roles in the prevention of HIV and the promotion of healthy, well-informed, responsible, and unprejudiced behaviors in the Chilean population.

Acknowledgments

Support for this study was provided by the Research Office at Pontificia Universidad Católica de Chile (DI-PUC 2005/027) and the AIDS International Training and Research Program (D43TW01419). We would also like to acknowledge our student participants, without whom this study would not have been possible.

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Table 1

Pre- and Postintervention Variable Values

Variable	Preintervention	Postintervention	Significance
HIV knowledge (range 1–48)	Mean: 41.23	Mean: 44.19	$p = .0001$
Self-efficacy related to HIV (range 1–6)	Mean: 4.46	Mean: 4.69	$p = .421$
Stigma and discrimination (range 1–8)	Mean: 5.92	Mean: 6.57	$p = .0001$

Table 2

Pre- and Postintervention OSCE Results

	Station 1 Pretest Counseling *n* (%)		Station 2 Posttest Counseling *n* (%)		Station 3 Informed Consent *n* (%)	
	OSCE1	**OSCE2**	**OSCE1**	**OSCE2**	**OSCE1**	**OSCE2**
Incompetent	7 (29.2%)	2 (8.3%)	5 (20.8%)	1 (4.2%)	2 (8.3%)	2 (8.3%)
Borderline	9 (37.5%)	7 (29.2%)	4 (16.7%)	11 (50%)	19 (79.2%)	6 (25%)
Competent	8 (33.3%)	15 (62.5%)	14 (58.3%)	12 (29.2%)	3 (12.5%)	16 (66.7%)

Note. OSCE = Objective Structured Clinical Examination.